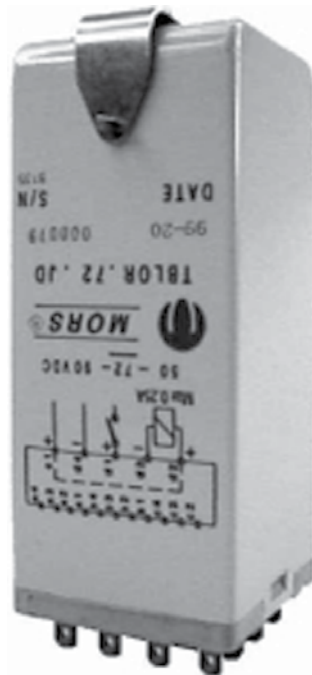


# TBL OR relay - Electronic timer, delay-on drop-out

## Datasheet



### Description

The electronic timer TBL OR is a delay-on drop-out timing module. It offers an extended range duration (0.25 seconds to 63.75 min) and controls an external load from a common source. The time delay with programmable lag is specified by external connections.

The plug-in design offers secure locking feature for maximum ease of maintenance (no wires need to be disconnected or other hardware removed for relay inspection or replacement). The resistance to impact and vibration is conform to standards in force for Railway Transported Equipment. Positive mechanical keying of relay to socket is built into relay and socket during manufacture and terminal identifications are clearly marked on identification plate that is permanently attached to the relay..

The TBL OR relay is pluggable in the following sockets: EA 102 B, EA 102 BF, EA 103 BF, EA 104 B, EA 104 BF, EA 105 BF, EA 112 BF

### Application

The TBL OR timing relay is designed for applications with a programmable timing function used for example in HVAC and lighting.

#### Features

- Delay-on drop-out timing module
- Extended time delay range
- Delay range from 0.25 s up to 63.75 min
- Time delay programmable by external connections with additive time combination
- Plug-in design with secure locking feature for maximum ease of maintenance
- -40 °C...+85 °C operating temperature

#### Benefits

- Proven reliable
- Long life cycle
- Accurate timing selection finger safe
- Easy to maintain and replace
- Low life cycle cost
- No maintenance

#### Railway compliancy

- CF 62-003 European railway standard
- NF F 16-101/102 Fire behaviour - Railway rolling stock
- EN50155 Railway application - electronic equipment used on rolling stock
- IEC 61373 Railway application - shock and vibration tests



# TBL OR relay

## Technical specifications



### Functional and connection diagrams

Timing diagram	Relay pin correspondence
<p><b>Type OR (delay on drop-out)</b> (also called delay on de-Energization, delay OFF or delay on break).</p> <p><b>Operation:</b> With permanent power supply ON and connected to terminals c1-d4 and timer input ON and connected to terminals d1-d4, the time delay devices operate as follows: When switch is closed, an output signal appears across terminals d2-d3 to actuate a load. When switch is opened, the time interval programmed by wiring from tables below begins. At end of interval, the output signal disappears across terminals d2-d3 shutting off the load.</p>	<p><b>Relay pin correspondence</b></p> <p>Example: <b>LE keying</b></p>

### Connection diagram

Connections	Function
d1	timer input (+)
d4	timer input and supply (-)
d2	timer delayed load output (+)
d3	timer delayed load output (-)
c1	timer permanent power (+)

**Time Delay Input Polarity:**  
d1 must be connected to +  
d1 to - is available upon request (NPTBLOR)  
(1 min to 32 min duration only)

Time delay	Short 0,25 to 63,75 s	Long 0,25 to 63,75 min
Connections	a1 - b1	-
b3 - a2	0,25 s	0,25 min
b3 - a3	0,5 s	0,5 min
b3 - a4	1 s	1 min
b3 - b4	2 s	2 min
b3 - c4	4 s	4 min
b3 - c3	8 s	8 min
b3 - c2	16 s	16 min
b3 - b2	32 s	32 min

**Note:** b3 - x connections are additives.  
Example: To make 5 min delay, connect b3 - a4 - c4



# TBL OR relay

## Technical specifications

### Time characteristics

Time function	Delay-on drop-out
Total time delay range	0.25 s...63.75 min
Time delay adjustment	Fixed after connecting the terminals
Adjustment / repeatability accuracy	$\pm 12.5\%$ / $\pm 1\%$ (adjustment with power off)

### Input data

Keying	$U_{nom}$ (VDC)	$U_{operating}$ (VDC)
LE	24	17 / 33
PX	48	35 / 60
JD	72	50 / 90
EM	110	77 / 138

### Electrical characteristics

Operating voltage	24 VDC ...110 VDC
Load voltage drop	< 3 V
Operating current	< 30 mA
Maximum load current	0.25 A
Dielectric strength	2000 VAC, 1 min between housing and tabs
Insulation resistance	$\geq 1000\text{ M}\Omega$ at 500 VDC



# TBL OR relay

## Technical specifications

### Mechanical & environmental characteristics

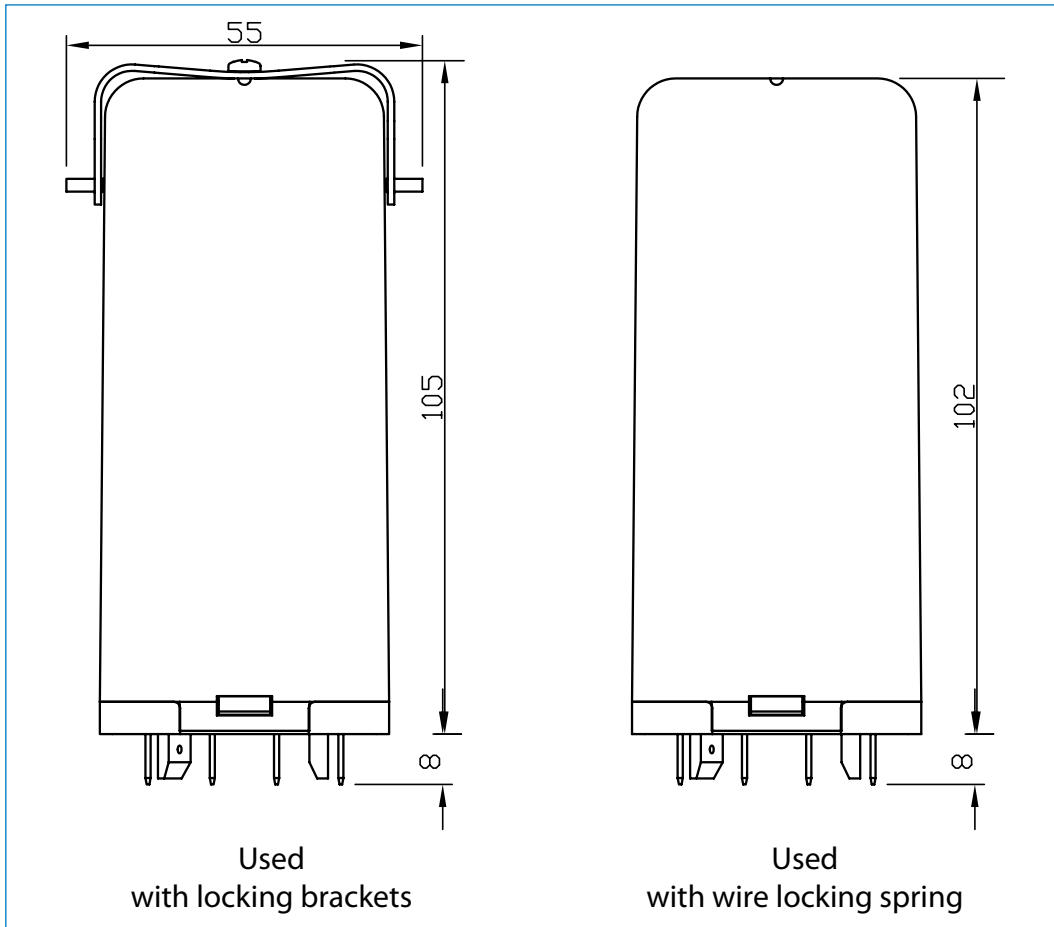
Vibration	NF F62-002 The tests are conducted in the X, Y , Z planes at frequency between 10 & 150 cycles (sinusoidal) at 2 g
Shock	NF F62-002 Tests are applied in both directions in the X, Y & Z planes. Then successive shocks are administered consisting of the positive component of sinusoidal with a value of 30 g, 18 ms Other vibration and shock tests can be performed on request
Life	MTBF of 476000 h
Weight	199 g (7 ounces)
Temperature	-40 °C...+85 °C
Humidity	93% RH, 40° C for 4 days
Salt mist	5% NaCl, 35° C for 4 days
Protection	IP40 (timing relay on socket)
Fire & smoke	Materials: Polycarbonate (cover) / polyester melamine (base) Note: These materials have been tested for fire propagation and smoke emission according standards NF F 16-101, NF F 16-102. And have been approved to be used on the English/French train channel shuttle.



# TBL OR relay

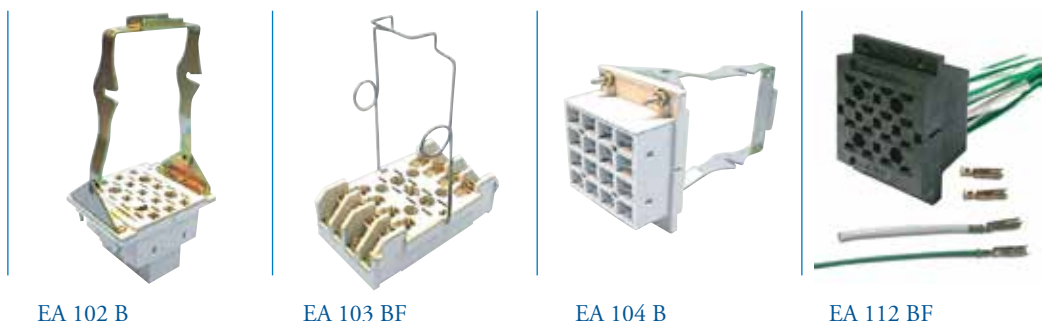
## Technical specifications

### Dimensions (mm)



# TBL OR relay

## Mounting possibilities / sockets



### Panel/flush mounting

EA 102 B	Locking bracket (905843), rear connection, double Faston 5 mm
EA 102 BF	Wire locking spring (926853), rear connection, single Faston 5 mm
EA 104 B	Locking bracket (905843), rear connection, single Faston 5 x 0.8 mm
EA 104 BF	Wire locking spring (926853), rear connection, single Faston 5 x 0.8 mm
EA 112 BF	Wire locking spring (926853), rear connection, crimp contact

### Surface/wall mounting

EA 103 BF*	Wire locking spring (926853), front connection, M3 screw 6.5 mm ring terminals (2,5 mm <sup>2</sup> )
EA 105 BF*	Wire locking spring (926853), front connection, single Faston 5 mm





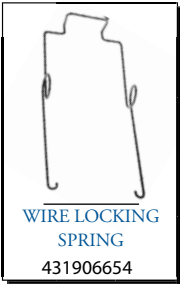



\* Mounting possibility on 35 mm rail EN 50022 by adding suffix D to the part number (see socket datasheet)

Note: Keying of relay to socket can be specified by adding the keying letters in the part number. See all details in the related socket datasheet.

# TBL OR relay

## Spare parts

### Spare parts - order part numbers

(1)  LOCKING BRACKET 905846	(1)  SCREW FOR BRACKET C927210	(1)  METAL STRAP (2) P928060	(1)  METAL STRAP (4) P928061
(1)  WIRE LOCKING SPRING 431906654	(1)  ROUND PLASTIC PLUGS 414928005	(2)  HEX. PLASTIC KEYS 414905678	(3)  LOCK PINS ASSY 2 SCREWS 906364 212903020

(1) Parts only for socket  
 (2) Parts for relay and socket  
 (3) Parts only for relay



# TBL OR relay

## Instructions

### Installation

Install socket and connect wiring correctly according identification to terminals. Plug relay into socket. Reverse installation into socket not possible due to mechanical blocking by snap-lock.

Don't reverse polarity of coil connection. Relays can be mounted (tightly) next to each other and in any attitude.

**Warning!** Never use silicon near by relays

### Operation

Before operating always apply voltage to coil to check correct operation.

Long term storage may corrode the silver on the relay pins. Just by plugging the relay into the socket, the female bifurcated receivers will automatically clean the corrosion on the pins and guarantee a good connection.

Do not use the relay in places with flammable gas as the arc generated from switching could ignite gasses.

### Maintenance

Correct operation of relay can easily be checked as transparent cover gives good visibility on the moving contacts. When the relay doesn't seem to operate correct, please check presence of coil voltage. Use a multimeter. If LED is used, coil presence should be indicated. If coil voltage is present, but the relay doesn't work, a short circuit of suppression diode is possible (The coil connection was reversed). If relay doesn't work after inspection, please replace relay unit by a similar model. Send defective relay back to manufacturer. Normal wear and tear excluded.





# TBL OR relay

## Ordering scheme

Configuration:



1. Relay model   2. Delay mode   3. Nominal voltage   4. Keying   5. Cover type   6. Language (test report)

This example represents a **TBL OR 24 LE F 1**

**Description:** TBLOR relay,  $U_{nom}$ : 24 VDC, Keying LE, relay cover for wire locking spring, test report in English

### 1. Relay model

<b>TBL</b>
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### 2. Delay model

<b>OR</b>	Time delay on drop-out
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### 3 & 4. Nominal voltage and keying

<b>LE</b>	24 VDC
<b>PX</b>	48 VDC
<b>JD</b>	72 VDC
<b>EM</b>	110 VDC

### 5. Relay cover type

–	Relay cover with lock pins
<b>F</b>	Relay cover for wire locking spring

### 6. Language on test report

–	French
<b>1</b>	English
<b>2</b>	Spanish





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